**IF4031 Pengembangan Aplikasi Terdistribusi**

# **Halaman Judul**

**EKSPLORASI NOSQL CASSANDRA**

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PROGRAM STUDI TEKNIK INFORMATIKA

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# **Output status server**

Perintah: **nodetool status**

|  |
| --- |
| Output *status* server dari node 167.205.35.19 |
| Datacenter: datacenter1  =======================  Status=Up/Down  |/ State=Normal/Leaving/Joining/Moving  -- Address Load Tokens Owns Host ID Rack  UN 167.205.35.21 4.77 MiB 256 ? 4ec1ca1d-9b8a-4936-996f-aae9f8228397 rack1  UN 167.205.35.22 5.11 MiB 256 ? d05af7e6-3fac-4a19-9da1-11464081676b rack1  UN 167.205.35.19 4.44 MiB 256 ? 4b1288f8-c3c2-4633-a48d-e1ad44203592 rack1 |

# **Percobaan dengan table users**

|  |  |
| --- | --- |
| No | 1 |
| Deskripsi | Membuat table users, lalu describe table |
| Query | CREATE TABLE users (  user\_id int PRIMARY KEY,  fname text,  lname text  );  DESCRIBE users; |
| Output | CREATE TABLE wijayaerick.users (  user\_id int PRIMARY KEY,  fname text,  lname text  ) WITH bloom\_filter\_fp\_chance = 0.01  AND caching = {'keys': 'ALL', 'rows\_per\_partition': 'NONE'}  AND comment = ''  AND compaction = {'class': 'org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy', 'max\_threshold': '32', 'min\_threshold': '4'}  AND compression = {'chunk\_length\_in\_kb': '64', 'class': 'org.apache.cassandra.io.compress.LZ4Compressor'}  AND crc\_check\_chance = 1.0  AND dclocal\_read\_repair\_chance = 0.1  AND default\_time\_to\_live = 0  AND gc\_grace\_seconds = 864000  AND max\_index\_interval = 2048  AND memtable\_flush\_period\_in\_ms = 0  AND min\_index\_interval = 128  AND read\_repair\_chance = 0.0  AND speculative\_retry = '99PERCENTILE'; |

|  |  |
| --- | --- |
| No | 2 |
| Deskripsi | Insert data ke table users, lalu tampilkan isi tabel |
| Query | INSERT INTO users (user\_id, fname, lname) VALUES (1745, 'john', 'smith');  INSERT INTO users (user\_id, fname, lname) VALUES (1744, 'john', 'doe');  INSERT INTO users (user\_id, fname, lname) VALUES (1746, 'john', 'smith');  SELECT \* FROM users; |
| Output | user\_id | fname | lname  ---------+-------+-------  1745 | john | smith  1744 | john | doe  1746 | john | smith |
| No | 3 |
| Deskripsi | Buat indeks baru, lalu describe table |
| Query | CREATE INDEX ON users (lname);  DESCRIBE users; |
| Output | CREATE TABLE wijayaerick.users (  user\_id int PRIMARY KEY,  fname text,  lname text  ) WITH bloom\_filter\_fp\_chance = 0.01  AND caching = {'keys': 'ALL', 'rows\_per\_partition': 'NONE'}  AND comment = ''  AND compaction = {'class': 'org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy', 'max\_threshold': '32', 'min\_threshold': '4'}  AND compression = {'chunk\_length\_in\_kb': '64', 'class': 'org.apache.cassandra.io.compress.LZ4Compressor'}  AND crc\_check\_chance = 1.0  AND dclocal\_read\_repair\_chance = 0.1  AND default\_time\_to\_live = 0  AND gc\_grace\_seconds = 864000  AND max\_index\_interval = 2048  AND memtable\_flush\_period\_in\_ms = 0  AND min\_index\_interval = 128  AND read\_repair\_chance = 0.0  AND speculative\_retry = '99PERCENTILE';  CREATE INDEX users\_lname\_idx ON wijayaerick.users (lname); |

|  |  |
| --- | --- |
| No | 4 |
| Deskripsi | Tampilkan semua yang memiliki nama belakang ‘smith’ |
| Query | SELECT \* FROM users WHERE lname = 'smith'; |
| Output | user\_id | fname | lname  ---------+-------+-------  1745 | john | smith  1746 | john | smith |

# **Percobaan Client API Cassandra (Python)**

|  |  |
| --- | --- |
| No | 1 |
| Deskripsi | Memulai koneksi ke cluster |
| Kode program | from cassandra.cluster import Cluster  from cassandra import ReadTimeout  cluster = Cluster(['159.65.140.125', '167.99.67.66',  '206.189.40.171', '206.189.47.228'])  session = cluster.connect('wijayaerick') |

|  |  |
| --- | --- |
| No | 2 |
| Deskripsi | Mengeksekusi kueri select |
| Kode program | rows = session.execute('SELECT user\_id, fname, lname  FROM users')  for (user\_id, fname, lname) in rows:  print(user\_id, fname, lname) |
| Output | 1745 john smith  1744 john doe  1746 john smith |

|  |  |
| --- | --- |
| No | 3 |
| Deskripsi | Mengeksekusi kueri insert into |
| Kode program | session.execute(  """  INSERT INTO users (user\_id, fname, lname)  VALUES (%s, %s, %s)  """,  (1234, "dog", "smith")  ) |

|  |  |
| --- | --- |
| No | 4 |
| Deskripsi | Mengeksekusi kueri select secara async |
| Kode program | query = "SELECT \* FROM users WHERE lname=%s ALLOW FILTERING"  future = session.execute\_async(query, ["smith"])  try:  rows = future.result()  for (user\_id, fname, lname) in rows:  print(user\_id, fname, lname)  except ReadTimeout:  log.exception("Query timed out:") |
| Output | 1745 john smith  1746 john smith  1234 dog smith |

Kode program lengkap:

|  |
| --- |
| # http://datastax.github.io/python-driver/getting\_started.html  from cassandra.cluster import Cluster  from cassandra import ReadTimeout  import logging as log  cluster = Cluster(['159.65.140.125', '167.99.67.66', '206.189.40.171', '206.189.47.228'])  session = cluster.connect('wijayaerick')  rows = session.execute('SELECT user\_id, fname, lname FROM users')  for (user\_id, fname, lname) in rows:  print(user\_id, fname, lname)  session.execute(  """  INSERT INTO users (user\_id, fname, lname)  VALUES (%s, %s, %s)  """,  (1234, "dog", "smith")  )  query = "SELECT \* FROM users WHERE lname=%s ALLOW FILTERING"  future = session.execute\_async(query, ["smith"])  try:  rows = future.result()  for (user\_id, fname, lname) in rows:  print(user\_id, fname, lname)  except ReadTimeout:  log.exception("Query timed out:") |

# **Rumusan query untuk fitur-fitur**

|  |  |
| --- | --- |
| No | 1 |
| Deskripsi | Membuat struktur data |
| Query | CREATE TABLE users (  username text PRIMARY KEY,  password text  );  CREATE TABLE friends (  username text,  friend text,  since timestamp,  PRIMARY KEY (username, friend)  );  CREATE TABLE followers (  username text,  follower text,  since timestamp,  PRIMARY KEY (username, follower)  );  CREATE TABLE tweets (  tweet\_id uuid PRIMARY KEY,  username text,  body text  );  CREATE TABLE userline (  username text,  time timeuuid,  tweet\_id uuid,  PRIMARY KEY (username, time)  ) WITH CLUSTERING ORDER BY (time DESC);  CREATE TABLE timeline (  username text,  time timeuuid,  tweet\_id uuid,  PRIMARY KEY (username, time)  ) WITH CLUSTERING ORDER BY (time DESC); |

|  |  |
| --- | --- |
| No | 2 |
| Deskripsi | Mendaftar user baru: insert row ke tabel users |
| Query | INSERT INTO users (username, password) VALUES ('wijayaerick', '123456');  INSERT INTO users (username, password) VALUES ('micin', '123456');  INSERT INTO users (username, password) VALUES ('msg', '123456'); |
| Output | username | password  -------------+----------  wijayaerick | 123456  msg | 123456  micin | 123456 |

|  |  |
| --- | --- |
| No | 3 |
| Deskripsi | Follow a friend: insert row ke tabel friends dan followers |
| Query | INSERT INTO friends (username, friend, since) VALUES ('wijayaerick', 'micin', '2018-10-20 16:20');  INSERT INTO friends (username, friend, since) VALUES ('micin', 'wijayaerick', '2018-10-20 16:20');  INSERT INTO followers (username, follower, since) VALUES ('wijayaerick', 'micin', '2018-10-20 16:20');  INSERT INTO followers (username, follower, since) VALUES ('micin', 'wijayaerick', '2018-10-20 16:20');  SELECT \* FROM friends;  SELECT \* FROM followers; |
| Output | username | friend | since  -------------+-------------+---------------------------------  wijayaerick | micin | 2018-10-20 16:20:00.000000+0000  micin | wijayaerick | 2018-10-20 16:20:00.000000+0000  username | follower | since  -------------+-------------+---------------------------------  wijayaerick | micin | 2018-10-20 16:20:00.000000+0000  micin | wijayaerick | 2018-10-20 16:20:00.000000+0000 |

|  |  |
| --- | --- |
| No | 4 |
| Deskripsi | Tweet: insert row ke tabel tweet, userline, timeline dan timeline semua follower |
| Query | INSERT INTO tweets (tweet\_id, username, body) VALUES (00000000-0000-0000-0000-000000000001, 'wijayaerick', 'my first tweet');  INSERT INTO userline (username, time, tweet\_id) VALUES ('wijayaerick', d2177dd0-eaa2-11de-a572-001b779c76e3, 00000000-0000-0000-0000-000000000001);  INSERT INTO timeline (username, time, tweet\_id) VALUES ('wijayaerick', d2177dd0-eaa2-11de-a572-001b779c76e3, 00000000-0000-0000-0000-000000000001);  INSERT INTO timeline (username, time, tweet\_id) VALUES ('micin', d2177dd0-eaa2-11de-a572-001b779c76e3, 00000000-0000-0000-0000-000000000001);  SELECT \* FROM tweets;  SELECT \* FROM userline;  SELECT \* FROM timeline; |
| Output | tweet\_id | body | username  --------------------------------------+----------------+-------------  00000000-0000-0000-0000-000000000001 | my first tweet | wijayaerick  username | time | tweet\_id  -------------+--------------------------------------+--------------------------------------  wijayaerick | d2177dd0-eaa2-11de-a572-001b779c76e3 | 00000000-0000-0000-0000-000000000001  username | time | tweet\_id  -------------+--------------------------------------+--------------------------------------  wijayaerick | d2177dd0-eaa2-11de-a572-001b779c76e3 | 00000000-0000-0000-0000-000000000001  micin | d2177dd0-eaa2-11de-a572-001b779c76e3 | 00000000-0000-0000-0000-000000000001 |

|  |  |
| --- | --- |
| No | 5 |
| Deskripsi | Menampilkan tweet per user |
| Query | SELECT \* FROM tweets WHERE username='wijayaerick'; |
| Output | tweet\_id | body | username  --------------------------------------+----------------+-------------  00000000-0000-0000-0000-000000000001 | my first tweet | wijayaerick |

|  |  |
| --- | --- |
| No | 6 |
| Deskripsi | Menampilkan timeline per user |
| Query | SELECT \* FROM timeline WHERE username='micin'; |
| Output | username | time | tweet\_id  ----------+--------------------------------------+--------------------------------------  micin | d2177dd0-eaa2-11de-a572-001b779c76e3 | 00000000-0000-0000-0000-000000000001 |

# **Referensi**

<http://cassandra.apache.org/>

<https://wiki.apache.org/cassandra/ClientOptions>

<http://datastax.github.io/python-driver/index.html>

<https://github.com/datastax/python-driver>

<https://github.com/tugas-itb-erick/cassandra-explore>